Work Plan and Methodology:

1. Literature survey
2. Synthesis of the benzotriazole derivatives.
3. Purification and Recrystallization and characterization of the synthesized derivatives.
4. Preparing and Interpretation of Spectral data.
5. Screening of derivatives for biological activities.

Methodology:

1). Literature survey:
Extensive literature was done referring journals, books, online journals, patents, scientific communications, internet sources and dissertations.

2). Synthesis of the benzotriazole derivatives:
Synthesis of the benzotriazole derivatives will be carried out by following Scheme of synthesis. The substitution of amide, acetamide or amino acid functional groups to benotriazole is effected by substitution, condensation, diazotization reactions to produce the derivatives expected to posses potential antimicrobial or antioxidant activities.

$$\begin{align*}
\text{N} & \text{N} \\
\text{N} & \text{H} \\
\text{1H-benzotriazole} & \\
+ \text{Substitution of alkylamide/acetamide or aminoacids} & \rightarrow \\
\text{Benzo triazole derivative with acetamide/amide/ AAs Substitution}
\end{align*}$$

Where R is various amides, acetamides, or amino acids substitutions.

3). Purification and recrystallization:
The prepared derivatives will be purified by re-crystallization, or preparing column chromatography and the formed products will be confirmed by the TLC in TLC chambers.

3). Characterization on basis of Physical properties and chemical properties:
Physical properties like melting point and boiling points, or chemical properties based on functional groups assumed to be present in compounds.

4). Preparing Spectral data:
The synthesized derivatives are subjected for spectral analysis following techniques depending upon the necessity with help of spectral data structural characterization is done and it will also give information about completion of reaction. The complete confirmation will be produced by Spectral data like IR spectra, NMR spectra and Mass spectra.

5). Screening of derivatives for biological activities:
The obtained derivatives are subjected for biological activities like antibacterial, antifungal and anti oxidant.
Determination of antimicrobial activity
Anti bacterial activity will be evaluated using the test organisms (S. aureus ATCC 29737, S. β hemolitic ATCC 10389, B. cereus ATCC 14603, P. aeruginosa ATCC 25619, E. coli ATCC 10536, and C. albicans ATCC 53324) etc from reliable sources is obtained for testing. The Culture media used for the activation of the microorganisms was soybean casein broth (SBCB) or any other suitable media.

Agar diffusion assay
The following the modified agar well diffusion method or cup plate method, and minimum inhibitory concentration (MIC) will be measured.